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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,645	01/22/2004	Jayati Ghosh	10030722-1	7708

7590 11/20/2007

AGILENT TECHNOLOGIES, INC.
Legal Department, DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599

EXAMINER	
ABDI, AMARA	

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
11/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/763,645	GHOSH ET AL.	
	Examiner	Art Unit	
	Amara Abdi	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 August 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/22/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's response to the last office action, filed September 17, 2007 has been entered and made of record.

2. In view of the Applicant arguments, the claim objections are expressly withdrawn.

3. In view of the Applicant amendments, the objection to the drawings are expressly withdrawn.

4. In view of the Applicant amendments, the objection to the specification is expressly withdrawn.

5. Applicant's arguments with respect to claims 1-20 and have been considered but are moot in view of the new ground(s) of rejection.

Remarks:

6. Applicant's argument with respect to claims 10-13, have been fully considered, but they are not persuasive.

Applicant argues that he cannot find justification in statute, rule, or case law for the rejections of claims 10-13.

However, in response to applicant's argument, Examiner would like to point out the Applicant's representative to the MPEP § 2106.

First: regarding claim 11, the Examiner would like to point out the Applicant's representative to the MPEP § 2106.01 computer related nonstatutory subject matter. MPEP§ 2106.01 states: "Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional

descriptive material" consists of data structures and computer programs, which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works, and a compilation or mere arrangement of data.

Both types of "descriptive material" are nonstatutory when claimed as descriptive material per se, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994)(discussing patentable weight of data structure limitations in the context of a statutory claim to a data structure stored on a computer readable medium that increases computer efficiency) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory)".

Second: regarding claims Regarding claims 10,12,13, the Examiner would like to point out the Applicant's representative to the MPEP § 2106.01 (I. Functional descriptive

material: "Data structures" representing descriptive material per se or computer program representing computer listing per se, II. Nonfunctional descriptive material).

the MPEP § 2106.01 states: "Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer. See, e.g., Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory.

Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality

to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions".

Therefore, The rejection of claims 10-13 under 35 U.S.C 101 is proper.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. The claimed inventions are directed to non-statutory subject matter. Claims 9-13 are rejected.

(1) Regarding claim 9, "computer instructions encoded in a computer-readable medium" must be "a computer-readable medium encoded with a computer executable instructions" in order to be a statutory subject matter.

(2) Regarding claim 11, "a feature extraction program that includes a feature location" must be "a feature extraction computer readable medium encoded with a computer program that includes a feature location" in order to be statutory subject matter. The applicant is urged to amend the claim 11 to become a statutory subject matter.

(3) The claims 10,12, and 13 are directed entirely to the various set of data and do not define any functional interrelationships between any of the data elements that

make up the "database". Consequently, the claims merely define the data per se, and do not define functional description material capable of imparting useful functionality to a general-purpose computer or derive. The applicant is urged to amend the claims 10,12, and 13 to become a statutory subject matter.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. (EP 1 162 572) In view of Mittal et al. (US-PGPUB 2005/0286764).

(1) Regarding claim 1:

Yakhini et al. disclose a method for classifying pixels of a microarray image (paragraph [0001], line 1-2), (the processing of region of microarray is read as the same concept as classifying pixels of a microarray) with observed intensities (paragraph [0003], line 2-3) within a region of interest (paragraph [0001], line 1-2), (the indicating of region is read as region of interest), the method comprising the classifying pixels in the region of interest (paragraph [0001], line 1-2) as either feature pixels or background pixels based on the intensities of the pixels (paragraph [0001], line 2-4), (the feature of the molecular array is read as feature pixels, and the optical or radiometric signal is read as background pixels); based on pixel locations (paragraph [0005], line 1-8) and

intensities (paragraph [0004], line 7-10), and accordingly classifying the pixels as either feature pixels or background pixels (paragraph [0001], line 1-4).

Yakhini et al. do not explicitly mention iteratively computing, the probabilities that the pixels are feature pixels and probabilities that the pixels are background pixels.

Mittal et al., in analogous environment, teaches a method for scene modeling and change detection, where computing the probability of the pixels to estimate either the pixels are feature or background (paragraph [0019], line 9-13), (it is read that the pixels are estimated as feature pixels or background pixels based on the comparison with the threshold).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where computing the probability of pixels to be either feature pixels or background pixels, in the system of Yakhini et al. in order to provide background modeling techniques of extended scope to include scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

(2) Regarding claim 2:

Yakhini et al. further disclose the method, where a feature-pixel and background-pixel classification (paragraph [0001], line 1-3) is stored in a feature mask (paragraph [0084], line 13-14), (the storing of the values in the array is read as the same concept as the storing of feature-pixel and background-pixel classification in a feature mask).

(3) Regarding claim 3:

Yakhini et al. disclose all the subject matter as described in claim 2 above.

Yakhini et al. do not explicitly mention the method, where the feature mask includes binary values corresponding to pixels in the region of interest, a first binary value indicating that a corresponding pixel is a feature pixel and a second binary value indicating that a corresponding pixel is a background pixel.

Mittal et al., in analogous environment, teaches a method for scene modeling and change detection, where using a binary mask as the difference between the present frame (feature pixel) and (background pixel) (paragraph [0118], line 2-6), (it is obvious to have first binary and the second binary since the difference is binary mask).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where using a binary value as difference between present frame (feature pixel) and (background pixel), in the system of Yakhini et al. in order to provide background modeling techniques of extended scope to include scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

(4) Regarding claim 4:

Yakhini et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. do not explicitly mention the method, where determining a high pixel intensity and a low pixel intensity for the region of interest; determining an intermediate point between the high pixel intensity and a low pixel intensity; classifying pixels with observed pixel intensities greater than or equal to the intermediate point as feature pixels and classifying pixels with observed pixel intensities less than the intermediate point as background pixels; and iteratively reclassifying pixels based on an

intermediate intensity between the mean intensity of feature pixels and the mean intensity of background pixels.

Mittal et al., in analogous environment, teaches a method for scene modeling and change detection, where the statistical method utilizes optical flow for capturing the dynamic of the scene. Along with optical flow, the intensity of a pixel is considered in an illumination-invariant space (paragraph [0017], line 2-5), and classifying the pixels based on the value of threshold (paragraph [0019], line 11-13), and iteratively reclassifying pixels based on the value of the threshold (paragraph [0019], line 9-13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where determining the intensity of the pixels, in the system of Yakhini et al. in order to provide background modeling techniques of extended scope to include scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. and Mittal et al., as applied to claim 1 above, and further in view of Lee et al. (US-PGPUB 2004/0202368).

Yakhini et al. and Mittal et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. and Mittal et al. do not explicitly mention the identifying of hole pixels that are feature pixels surrounded by background pixels and background pixels

surrounded by feature pixels and reclassifying hole pixels in order to increase the continuity of feature-pixel and background pixel classification with respect to location within the region of interest.

Lee et al., in analogous environment, teaches a learnable object segmentation, where detecting the hole pixels as feature pixels surrounded by background pixels and background pixels surrounded by feature pixels (paragraph [0084], line 2-8), (the examiner interpreted that some of feature pixels are within the boundary, and some of the them are outside the region of interest, and the same thing applies to the background pixels). And reclassifying the hole pixels in order to increase the continuity of feature-pixel and background pixel classification with respect to location within the region of interest (paragraph [0121], line 3-11; and paragraph [0123], line 3-6), (the increasing of the continuity of feature-pixel and background pixel classification is read as filling the holes to remove extraneous pixels and smooth region boundaries).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Lee et al., where identifying the hole pixels, in the system of Yakhini et al. in order to provides an accurate and robust method for object segmentation on complicated object types, as well as providing a semi-automatic method for user to train the segmentation recipe (paragraph [0010], line 2-6).

12. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. and Mittal et al., as applied to claim 1 above, and further in view of Bow et al. (STIC), (pattern recognition and image preprocessing [electronic resource]).

(1) Regarding claim 6:

Yakhini et al. and Mittal et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. and Mittal et al. do not explicitly mention the method, where classifying the pixel as feature when P(F/I,x)>=P(B/I,x); until a maximum number of iterations are performed.

Bow, sing-Tze, in analogous environment, teaches a pattern recognition and image preprocessing, where using Bayes discriminant function for given probability function that the state nature is a pattern belonging to certain class (the examiner interpreted that P(wi/x) has the same concept as P(F/I,x) and P(B/I,x)) (Page 85, line 16-22). Also classifying a pixel as a feature pixel when {P(x/wk)P(wk)> P(x/wi)P(wi)} (Page 87, line 21-24), (the examiner interpreted that P(F/I,x)= P(x/wk)P(wk), and P(B/I,x)= P(x/wi)P(wi)), until a maximum number of iterations are performed (Page 88, line 7-10).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Bow, sing-Tze, where classifying the pixel as feature when P(F/I,x)>=P(B/I,x); until a maximum number of iterations are performed, in the system of Yakhini et al. in order to speed up the processing of an image, it is. therefore necessary to explore a way to accurately represent the image with much less amount of data but without losing any important information for the interpretation (Page 10, line 31-35).

(2) Regarding claim 7:

Yakhini et al. and Mittal et al. disclose all the subject matter as described in claim 6 above.

Yakhini et al. and Mittal et al. do not explicitly mention the method, where the Bayesian posterior probability P(F/I,x) is calculated as: P(F/I,x)=P(F,I,x)/P(I/x)={P(i/x,F)*P(F,x)}/P(I,x)= { P(i/x,F)*P(F/x)}/P(x)}/P(I,x) and where the Bayesian posterior probability P(B/I,x) is calculated as: P(B/I,x)=P(B,I,x)/P(I/x)={P(i/x,B)*P(B,x)}/P(I,x)= { P(i/x,B)*P(B/x)}/P(x)}/P(I,x), where the pixel is classified as a feature pixel where : P(F/I,x)/ P(B/I,x)>=1 as recited in claim 7.

Bow, sing-Tze, in analogous environment, teaches a pattern recognition and image preprocessing, where the Baye's discriminant function is written as: P(wi/x)={P(x/wi)*P(wi)}/ P(x) (Page 85, line 16), (the examiner interpreted that P(wi/x) has the same concept as P(F/I,x) and P(B/I,x)), and {P(x/wk)P(wk)> P(x/wi)P(wi)}, where : P(F/I,x)= P(x/wk)P(wk), and P(B/I,x)= P(x/wi)P(wi) (Page 87, line 21-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Bow, sing-Tze, where calculating the Bayesian posterior probability, in the system of Yakhini et al. in order to speed up the processing of an image, it is therefore necessary to explore a way to accurately represent the image with much less amount of data but without losing any important information for the interpretation (Page 10, line 31-35).

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al., Mittal et al., and Bow et al. (STIC), as applied to claim 7 above, and further in view of Padilla et al. (US-PGPUB 2003/0233197).

Yakhini et al., Mittal et al., and Bow et al. (STIC) disclose all the subject matter as described in claim 7 above.

Yakhini et al., Mittal et al., and Bow et al. (STIC) do not explicitly mention the method, where Bayesian posterior probabilities are calculated for each channel of a two-channel microarray.

Padilla et al., in analogous environment, teaches a discrete Bayesian analysis of data, where using microarray to contain a human genes including intensities (paragraph [0312], line 10-13), and a series of channel grooves, or spots are formed on substrate and reagents are selectively flowed through the channels (paragraph [0085], line 15-18).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Padilla et al., where Bayesian posterior probabilities are calculated for each channel of a two-channel microarray, in the system of Yakhini et al. in order to predict outcomes of other conditions or perturbations or to identify conditions or perturbations, for diagnosis or for other predictive analysis (paragraph [0008], line 11-13).

14. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. and Mittal et al., as applied to claim 1 above, and further in view of Gelenbe et al. (US 5,995,651).

(1) Regarding claim 9:

Yakhini et al. and Mittal et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. and Mittal et al. do not explicitly mention a computer instruction encoded in a computer-readable medium that implements the method of claim 1 as recited in claim 9.

Gelenbe et al., in analogous environment, teaches an image content classification method, system and computer program using texture patterns, where a computer program is used to implement the method (column 1, line 60).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Gelenbe et al., where the method is implemented in a computer program, in the system of Yakhini et al. in order to provide method and computer programs which are highly accurate which may operate at high speeds, so that large volumes of images data may be processed (column 1, line 62,63; and line 66-67).

(2) Regarding claim 11:

Yakhini et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. do not explicitly mention the following items:

1) a feature location and size determination step that includes the method for classifying pixels with observed intensities within the region of interest;

2) a feature extraction program.

(A) Concerning item 1):

Mittal et al. disclose a feature location (paragraph [0093], line 2-4) and size determination step (paragraph [0081], line 3-6) that includes the method for classifying pixels (paragraph [0011], line 5-7) with observed intensities within the region of interest of claim 1 (paragraph [0017], line 3-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where classifying pixels, in the system of Yakhini et al. in order to provide background modeling techniques of extended scope to include scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

(B) Concerning item 2):

Gelenbe et al., in analogous environment, teaches an image content classification method, system and computer program using texture patterns, where a computer program is used in the system (column 1, line 60).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Gelenbe et al., where the computer program is used, in the system of Yakhini et al. in order to provide method and computer programs which are highly accurate which may operate at high speeds, so that large volumes of images data may be processed (column 1, line 62,63; and line 66-67).

14. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. and Mittal et al., as applied to claim 1 above, and further in view of Kondo (US-PGPUB 2004/0234160).

Yakhini et al. and Mittal et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. and Mittal et al. do not explicitly mention that a data structure carried out by the method of claim 1 stored in a computer-readable medium.

Kondo, in analogous environment, teaches a data converting apparatus and data converting method, learning device and learning method, and recording medium, where a data structure is stored in a computer-readable medium (paragraph [0103], line 2-6)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Kondo, where the data structure is stored in a computer-readable medium, in the system of Yakhini et al. in order to converts image data into higher quality image data, and enable a user to adjust the image quality of the image data (paragraph [0042], line 2-4).

16. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al., Mittal et al., and Gelenbe et al., as applied to claim 11 above, and further in view of Belkin et al. (US 6,738,087).

(1) Regarding claim 12:

Yakhini et al., Mittal et al. disclose all the subject matter as described in claim 11 above.

Yakhini et al., Mittal et al. do not explicitly mention the transferring of the data produced by the feature extraction program to a remote location.

Belkin et al., in analogous environment, teaches a method and system for transferring live video pictures from a video camera to a remote video displayer via conventional telephone line, where storing each data block in a memory means, and successively transferring its address code information to a remote video-display system (column 2, line 31-37) (the remote video-display is read as the remote location).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Belkin et al., where transferring the data to the remote location, in the system of Yakhini in order to transfer live video data through low-bandwidth communication lines (column 2, line 21-23) and especially useful for video pictures taken by stationary video camera (for example: security camera) (column 2, line 11-13).

(2) Regarding claim 13:

Yakhini et al., Mittal et al. disclose all the subject matter as described in claim 11 above.

Yakhini et al., Mittal et al. do not explicitly mention the receiving of the data produced by the feature extraction program from a remote location.

Belkin et al., in analogous environment, teaches a method and system for transferring live video pictures from a video camera to a remote video displayer via conventional telephone line, where the remote video-display receives a data image (column 2, line 60-61).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Belkin et al., where transferring the data to the remote location, in the system of Yakhini et al. in order to transfer live video data through low-bandwidth communication lines (column 2, line 21-23) and especially useful for video pictures taken by stationary video camera (for example: security camera) (column 2, line 11-13).

17. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. in view of Shames (US 6,990,221).

Yakhini et al. disclose a feature-extraction system comprising:

a means for receiving and storing a scanned image of a microarray (paragraph [0003], line 3-4);

a gridding means for determining putative feature positions (paragraph [0018], line 2-3) and sizes (paragraph [0034], line 1-2) within the scanned image of the microarray (paragraph [0001], line 3-4);

feature-mask-generating logic that classifies pixels as feature-pixels and background-pixels (paragraph [0001], line 1-4) based on pixel locations (paragraph [0005], line 1-8) and intensities (paragraph [0004], line 7-10);

a feature extraction module that extracts signal data from the scanned image of the microarray (paragraph [0006], line 8-10).

Yakhini et al. do not explicitly mention the preview-mode display logic that displays feature positions and sizes obtained from the generated feature mask, solicits feedback from a user, and corrects the feature positions and sizes.

Shams, in analogous environment, teaches an automated and array image segmentation and analysis, where displaying feature positions and sizes obtained from the generated feature mask (column 10, line 41-41), (the displaying of the image frame is read as the same concept as the displaying of the feature positions and sizes), solicits feedback from a user (column 10, line 51-54), and corrects the feature positions (column 10, line 49-50), and sizes (column 2, line 24-26), (the adjusting of position and size is read as the same concept as the correcting of position and size);

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Shams, where displaying the image frames, in the system of Yakhini et al. in order to process irregular micro-array patterns, search for DNA image spots, and accurately quantify, and intuitively display, specific signals while accounting for the local background (column 3, line 10-16).

18. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. and Shames, as applied to claim 14 above, and further in view of Mittal et al. (US-PGPUB 2005/0286764).

(1) Regarding claim 15:

Yakhini et al. and Cattell disclose all the subject matter as described in claim 14 above.

Furthermore, Yakhini et al. disclose a feature extraction (paragraph [0006], line 8-10) system (see the Abstract, line 1) for classifying pixels of a microarray image (paragraph [0001], line 1-2), (the processing of region of microarray is read as the same concept as classifying pixels of a microarray) with observed intensities (paragraph [0003], line 2-3) within a region of interest (paragraph [0001], line 1-2), (the indicating of region is read as region of interest), the method comprising the classifying pixels in the region of interest (paragraph [0001], line 1-2) as either feature pixels or background pixels based on the intensities of the pixels (paragraph [0001], line 2-4), (the feature of the molecular array is read as feature pixels, and the optical or radiometric signal is read as background pixels); based on pixel locations (paragraph [0005], line 1-8) and intensities (paragraph [0004], line 7-10), and accordingly classifying the pixels as either feature pixels or background pixels (paragraph [0001], line 1-4).

Yakhini et al. and Cattell do not explicitly mention iteratively computing, the probabilities that the pixels are feature pixels and probabilities that the pixels are background pixels.

Mittal et al., in analogous environment, teaches a method for scene modeling and change detection, where computing the probability of the pixels to estimate either the pixels are feature or background (paragraph [0019], line 9-13), (it is read that the pixels are estimated as feature pixels or background pixels based on the comparison with the threshold).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where computing the probability of

pixels to be either feature pixels or background pixels, in the system of Yakhini et al. in order to provide background modeling techniques of extended scope to include scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

(2) Regarding claim 16:

Yakhini et al. further disclose a feature extraction (paragraph [0006], line 8-10) system (see the Abstract, line 1), where a feature-pixel and background-pixel classification (paragraph [0001], line 1-3) is stored in a feature mask (paragraph [0084], line 13-14), (the storing of the values in the array is read as the same concept as the storing of feature-pixel and background-pixel classification in a feature mask).

(3) Regarding claim 17:

Yakhini et al. and Cattell disclose all the subject matter as described in claim 15 above.

Yakhini et al. and Cattell do not explicitly mention the method, where determining a high pixel intensity and a low pixel intensity for the region of interest; determining an intermediate point between the high pixel intensity and a low pixel intensity; classifying pixels with observed pixel intensities greater than or equal to the intermediate point as feature pixels and classifying pixels with observed pixel intensities less than the intermediate point as background pixels; and iteratively reclassifying pixels based on an intermediate intensity between the mean intensity of feature pixels and the mean intensity of background pixels.

Mittal et al., in analogous environment, teaches a method for scene modeling and change detection, where the statistical method utilizes optical flow for capturing the dynamic of the scene. Along with optical flow, the intensity of a pixel is considered in an illumination-invariant space (paragraph [0017], line 2-5), and classifying the pixels based on the value of threshold (paragraph [0019], line 11-13), and iteratively reclassifying pixels based on the value of the threshold (paragraph [0019], line 9-13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where determining the intensity of the pixels, in the system of Yakhini et al. in order to provide background modeling techniques of extended scope to include scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

19. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al., Shames, and Mittal et al., as applied to claim 15 above, and further in view of Bow et al. (STIC), (pattern recognition and image preprocessing [electronic resource]).

(1) Regarding claim 18:

Yakhini et al. and Cattell, and Mittal et al. disclose all the subject matter as described in claim 15 above.

Yakhini et al. and Cattell, and Mittal et al. do not explicitly mention the method,

where classifying the pixel as feature when P(F/I,x)>=P(B/I,x); until a maximum number of iterations are performed.

Bow, sing-Tze, in analogous environment, teaches a pattern recognition and image preprocessing, where using Bayes discriminant function for given probability function that the state nature is a pattern belonging to certain class (the examiner interpreted that P(wi/x) has the same concept as P(F/I,x) and P(B/I,x)) (Page 85, line 16-22). Also classifying a pixel as a feature pixel when {P(x/wk)P(wk)> P(x/wi)P(wi)} (Page 87, line 21-24), (the examiner interpreted that P(F/I,x)= P(x/wk)P(wk), and P(B/I,x)= P(x/wi)P(wi)), until a maximum number of iterations are performed (Page 88, line 7-10).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Bow, sing-Tze, where classifying the pixel as feature when P(F/I,x)>=P(B/I,x); until a maximum number of iterations are performed, in the system of Yakhini et al. in order to speed up the processing of an image, it is therefore necessary to explore a way to accurately represent the image with much less amount of data but without losing any important information for the interpretation (Page 10, line 31-35).

<u>(2) Regarding claim 19:</u>

Yakhini et al. and Cattell, and Mittal et al. disclose all the subject matter as described in claim 18 above.

Yakhini et al. and Cattell, and Mittal et al. do not explicitly mention the method, where the Bayesian posterior probability P(F/I,x) is calculated as: P(F/I,x)=P(F,I,x)/P(I/x)={P(i/x,F)*P(F,x)}/P(I,x)= { P(i/x,F)*P(F/x)}/P(x)}/P(I,x) and where the Bayesian posterior probability P(B/I,x) is calculated as: P(B/I,x)=P(B,I,x)/P(I/x)={P(i/x,B)*P(B,x)}/P(I,x)= { P(i/x,B)*P(B/x)}/P(x)}/P(I,x), where the pixel is classified as a feature pixel where : P(F/I,x)/ P(B/I,x)>=1 as recited in claim 7.

Bow, sing-Tze, in analogous environment, teaches a pattern recognition and image preprocessing, where the Baye's discriminant function is written as: P(wi/x)={P(x/wi)*P(wi)}/ P(x) (Page 85, line 16), (the examiner interpreted that P(wi/x) has the same concept as P(F/I,x) and P(B/I,x)), and {P(x/wk)P(wk)> P(x/wi)P(wi)}, where : P(F/I,x)= P(x/wk)P(wk), and P(B/I,x)= P(x/wi)P(wi) (Page 87, line 21-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Bow, sing-Tze, where calculating the Bayesian posterior probability, in the system of Yakhini et al. in order to speed up the processing of an image, it is therefore necessary to explore a way to accurately represent the image with much less amount of data but without losing any important information for the interpretation (Page 10, line 31-35).

20. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al., Shames, Mittal et al., and Bow et al. (STIC), (pattern recognition and image preprocessing [electronic resource]), as applied to claim 19 above, and further in view of Padilla et al. (US-PGPUB 2003/0233197).

Yakhini et al., Shames, Mittal et al., and Bow et al. disclose all the subject matter as described in claim 19 above.

Yakhini et al., Mittal et al., and Bow et al. (STIC) do not explicitly mention the method, where Bayesian posterior probabilities are calculated for each channel of a two-channel microarray.

Padilla et al., in analogous environment, teaches a discrete Bayesian analysis of data, where using microarray to contain a human genes including intensities (paragraph [0312], line 10-13), and a series of channel grooves, or spots are formed on substrate and reagents are selectively flowed through the channels (paragraph [0085], line 15-18).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Padilla et al., where Bayesian posterior probabilities are calculated for each channel of a two-channel microarray, in the system of Yakhini et al. in order to predict outcomes of other conditions or perturbations or to identify conditions or perturbations, for diagnosis or for other predictive analysis (paragraph [0008], line 11-13).

Contact Information:

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amara Abdi whose telephone number is (571) 270-1670. The examiner can normally be reached on Monday through Friday 7:30 Am to 5:00 PM E.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wu Jingge can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amara Abdi
11/14/2007

JINGGE WU
SUPERVISORY PATENT EXAMINER